REMARKS

Claims 1, 2, and 4-7 are presently pending in the application.

Claim 1 has been amended to recite that component (C) is contained in an amount of 0.002 to 0.06 percent by mass in terms of boron, based on the total mass of the composition. Support for this amendment may be found in the specification at least at page 17, lines 3-9. Additionally, claim 3 has been canceled. No new matter has been added by these amendments, and entry is respectfully requested.

The Examiner has again rejected claims 1-7 under 35 U.S.C. § 103(a) as being unpatentable over U.S. Patent No. 3,853,772 of Adams ("Adams") in combination with U.S. Patent No. 6,617,286 of Sato et al. ("Sato") for the reasons set forth previously. Briefly, the Examiner argues that Adams discloses extreme pressure lubricants having improved wear tolerance which comprise a lubricating base oil and, as additives, (a) hydrated alkali metal borates in an amount of 1 to 25 weight %, (b) an alkaline earth metal sulfonate which may be overbased, and (c) succinimide compounds. The Examiner acknowledges that Adams does not teach including a borated succinimide as claimed. However, the Examiner argues that Sato teaches that such additives are well-known in lubricant compositions suitable for use in transmissions, and that the content of boron in a boron-containing succinimide is usually 0.1 to 5 weight % based on the total weight of the compound. The Examiner thus concludes that it would have been obvious to have included the borated succinimide component of Sato as an additional additive in the lubricant composition of Adams if its known imparted properties were so desired.

Applicant previously argued that excellent anti-wear properties and fatigue life are obtained by the presently claimed compositions having low kinematic viscosities and specific components (A) – (C) in particular amounts. In response, the Examiner argues that both Adams and Sato teach a wide range of viscosities for the base oil component, including those which allegedly encompass the claimed range. The Examiner also takes the position that unexpected results have not been presented for the entire scope of the claims since component (C) may be added to the composition in any amount.

Finally, the Examiner responds to Applicant's previous argument that the concentration of component (C) (previously recited in claim 3) is not taught or suggested by Adams. The

Examiner argues that the hydrated alkali metal borate component taught by Adams is not limited to $NaBO_2$-H_2O, but that Adams broadly teaches M_2O-xB_2O_3-yH_2O in which x is 0.68 to 4 and y is a number up to 5. Accordingly, the Examiner concludes that the boron content varies widely depending on the numbers "x" and "y" and argues that it is not clear that claim 3, which recites that component (C) is present in an amount of 0.002 to 0.1 percent by mass in terms of boron, patentably distinguishes the claimed composition over the combination of Adams and Sato. Applicant respectfully traverses this rejection and the arguments in support thereof for the reasons set forth previously on the record, which Applicant relies upon in full, and for the additional reasons which follow, and respectfully requests reconsideration and withdrawal of the rejection.

As previously explained on the record, it is known in the art of lubricating oils that there is a trade-off between obtaining good anti-wear properties and achieving long fatigue life. As described in the present application, the extreme pressure properties and anti-wear properties of lubricating composition oils may be greatly enhanced by adding sulfur- or phosphorus-based additives. However, each of these types of additives may cause additional problems with the oils. Therefore, it has been conventionally difficult to improve both the anti-wear properties and fatigue life of a conventional lubricating oil composition, particularly one which comprises a low viscosity base oil, such as one having a kinematic viscosity of 1 to 10 mm^2/s at 100°C.

However, Applicant has determined that by combining such a low viscosity base oil and particular components, it is possible to optimize both anti-wear properties and fatigue life. Specifically, a composition containing specific amounts of: (A) a boron-containing ashless dispersant, (B) an alkaline earth metal-based detergent with a base number of 0 to 500 mg KOH/g, and (C) an alkali metal borate or a hydrate thereof, provides favorable results. The advantageous effects of the presently claimed composition are demonstrated in Table 1 of the present application. It can be seen that all of the samples in Inventive Examples 1 to 7, which contained a lubricating base oil having a low kinematic viscosity of 3.8 mm^2/s at 100°C and components (A) – (C) in the claimed amounts, exhibited excellent anti-wear properties and long fatigue life.

However, as shown in Table 2, compositions which lacked (A), (B), and/or (C), or compositions in which the amounts of these components did not fall within the claimed ranges,

did not exhibit the desired effects. Specifically, the samples of Comparative Example 4, which contained no component (C), and Comparative Example 1, which contained less than 0.02 mass % of component (A), exhibited poor anti-wear properties. Further, the samples of Comparative Examples 2 and 3, which both contained less than 0.01 mass% of component (B), exhibited poor fatigue life. Accordingly, the criticalities of the claimed components and amounts thereof have been demonstrated.

Amended claim 1 recites that the alkali metal borate or hydrate thereof (component (C)) is contained in the composition in an amount of 0.002 to 0.06 mass % in terms of boron based on the total mass of the composition. Sato does not teach or suggest an alkali metal borate, and the claimed borate amount is not taught or suggested by Adams. Rather, Adams teaches hydrated alkali metal borates having the formula M_2O-xB_2O_3-yH_2O, in which x = 0.68 to 4 and y is a number up to 5 (col. 2, lines 55-62). The *minimum* possible amount of boron in such a borate is present when M = K (potassium), x = 0.68 and y = 5, yielding a boron content of 15g boron/232 g borate= 6.5 weight % boron in the borate. If the minimum amount of such a borate additive (1 weight %, as taught in Adams col. 3, lines 31-32) is added to the composition, the composition of Adams will thus contain 0.065 weight % boron based on the total weight of the composition, which is outside of the claimed range. Since this is the minimum possible boron amount taught by Adams, all other alkali metal borates of Adams will necessarily have *greater* amounts of boron.

Further, it can be determined from the Table of Adams (cols. 11-12) that all of the compositions in Examples 1-13 contain 0.33 to 0.65 weight % boron. For example, 5 wt% borate x 10.8 g boron/83.8 g $NaBO_2.H_2O$ = 0.65 weight % boron. Similarly, 2.5 wt% borate x 10.8 g boron/83.8 g $NaBO_2.H_2O$ = 0.33% weight boron. These boron amounts are far greater than the 0.007 to 0.04 mass % boron contents exemplified in Examples 1-7 of Table 1 of the present application.

Accordingly, Adams does not teach or suggest the claimed amount of alkali metal borate in the composition. Furthermore, based on the broad teaching of Adams, the criticality of the claimed amount of component (C) would not have been expected. As explained in the present specification at page 17, lines 9-15, when the amount of component (C) in a lubricating oil

composition is too low, the composition is ineffective at inhibiting fatigue caused by pitching and flaking. Alternatively, when too large an amount of component (C) is included, the storage stability of the resulting lubricating oil composition deteriorates. Not only does Adams not teach or suggest an amount of alkali metal borate within the claimed range, it should be noted that the *minimum* boron content which may be calculated based on the teachings of Adams is *greater* that the maximum claimed amount, such that all of the other possible alkali metal borates of Adams would necessarily result in even higher boron contents. Thus, Adams clearly does not recognize the negative effects which are observed by including too large an amount of alkali metal borate in a lubricating oil composition.

For these reasons, even if the borated succinimides taught by Sato were to be added to the composition of Adams, the resulting composition would still not contain the claimed amount of component (C), and there would also have been no reasonable expectation that such a modification of the Adams composition would provide the results observed by the presently claimed invention. Accordingly, reconsideration and withdrawal of the § 103(a) rejection are respectfully requested.

Based on the preceding Amendments and Remarks, it is respectfully submitted that the pending claims are patentably distinct from the prior art of record and in condition for allowance. A Notice of Allowance is respectfully requested.

Respectfully submitted,
Eitaro MORITA

October 18, 2007 By: /for Schwarze/ Reg. No. 25,918
(Date) **SANDRA M. KATZ**

Registration No. 51,864
AKIN, GUMP, STRAUSS, HAUER & FELD, L.L.P.
One Commerce Square
2005 Market Street, Suite 2200
Philadelphia, PA 19103-7086
Telephone: (215) 965-1200
Direct Dial: (215) 965-1344
Facsimile: (215) 965-1210
E-Mail: skatz@akingump.com

SMK:smk
Encl.: Petition for Extension of Time (two months)
Request for Continued Examination (RCE)